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IN THE

Supreme Court of the United States

OCTOBER TERM, 1980

SIDNEY A. DIAMOND,
COMMISSIONER OF PATENTS AND TRADEMARKS,
Petitioner,

V.

JOHN J. BRADLEY AND BENJAMIN S. FRANKLIN,
Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

BRIEF FOR THE RESPONDENTS

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BRIEF FOR THE RESPONDENTS

QUESTIONS PRESENTED

The question presented by the Commissioner is hypothetical. There is no computer program disclosed or claimed by the Respondents. An accurate formulation of the questions presented is as follows:

1. Is a computer machine created by the art and industry of man and which has not always existed a "machine" as that term is used in 35 USC 101?

2. Is a new man made computer machine comprising elements arranged in a unique combination wherein each

element cooperates and functions with each other to mutually achieve an improved result patentable subject matter within the meaning of 35 USC 101?

PARTIES TO THE PROCEEDING

The caption shows all the parties. However the inventors, John J. Bradley and Benjamin S. Franklin (Respondents), have assigned (Reel 3188, Frames 124, 125) the invention to Honeywell Information Systems Inc. by a written instrument dated April 8, 1975 and April 17, 1975 respectively.

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CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

Article I, Section 8, Clause 8, of the Constitution of the United States provides:

> The Congress shall have Power ***
> To promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive right to their respective Writings and Discoveries. . . .

The relevant statute, 35 USC 101, is correctly set forth in the Commissioner's Brief.

STATEMENT

Certiorari was granted as to a patent application for a computer machine which had been rejected by the Board of Appeals of the United States Patent and Trademark Office (hereafter "Patent Office" or "PTO") because of the allegation that the invention was a computer program. The rejection was unanimously reversed by the United States Court of Customs and Patent Appeals (hereafter "the Court below" or "CCPA").

I.

WHAT THE INVENTION IS.

The Respondents' invention is one of a series of inventions which collectively define an entirely new computer machine which is now being commercially marketed worldwide as the Honeywell Series 60, Level 64 computer. This computer

was developed through the joint efforts of technical staffs located in the United States and France. Their efforts extended over several years, involved hundreds of engineers and development costs exceeded $25 million dollars. Respondents' invention is a machine. It comprises register elements, hardware gates, logic circuits and memory elements which are permanently incorporated into the Level 64 computer. The individual hardware elements of the invention cooperate and function with each other to automatically and substantially instantaneously change the physical capabilities of the Level 64 computer.

With the advent of multiprocessing[1] and multiprogramming,[2] the physical characteristics, internal structure and operational capabilities of computers became very complex. One major problem was the reinitialization of such computers.[3] To facilitate computer usage it was necessary to further improve them. By instantaneously changing the computer's internal physical characteristics for accommodating different job requirements, Respondents' invention improves computer efficiency. For example, the physical capabilities of the overall computer that are necessary to solve business problems are different than those required to

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[1]Multiprocessor — a computer with multiple arithmetic and logic units for simultaneous use and capability. See *computer Dictionary and Handbook* by Charles J. Sippl and Charles P. Sippl, page 285.

[2]Multiprogramming — The concurrent execution of two or more programs by a single computer (JA-87) or, a technique for handling numerous routines or programs simultaneously by overlapping or interleaving their execution; i.e., permitting more than one program to time-share machine components. See *Computer Dictionary and Handbook* by Charles J. Sippl and Charles P. Sippl, page 285.

[3]Reinitialization is necessary when it is desired to change the architecture of a computer for accommodating different jobs; or when the computer system "crashes" i.e. it becomes passive.

solve scientific problems. The invention can rapidly change the architecture of the computer from that of a business type architecture to a scientific type. This is just one of many different improvements that the invention provides. The invention does this by enabling the electronic switches of the system base structure to connect or disconnect various structures of the computer without having to reinitialize the computer system. The invention eliminates the need for complete reinitialization of the overall computer system involving the setting of all the electronic switches within the computer and associated peripheral subsystems required for transforming a passive computer into an active computer — an operation which has always been time-consuming.

The various elements of the Respondents' claimed combination invention are described in the specification[4] and shown in Figures 1-15 of the drawings.[5] One element of the claimed combination is referred to as a system base structure[6] which is typically comprised of integrated flip-flop circuits,[7] or as a series of integrated registers shown in photograph (e) of the Joint Appendix.[8] Another element of

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[4]JA 24-97.

[5]JA 99-120.

[6]JA-103, Figure 6.

[7]The Microcomputer Dictionary and Guide, by Charles J. Sippl and David A. Kidd on page 129 defines flip-flops as follows:

> "Basic logic gates can be grouped together to form components that are capable of storing and/or altering binary data. The most common component used for storage within the arithmetic unit of the computer is the flip-flop. A flip-flop is a sequential switching circuit capable of storing one bit (binary digit) of information. It has two stable states."

A flip-flop therefore can be likened to a switch that is either on or off.

[8]JA-9.

the claimed combination is a "scratchpad memory" or "scratchpad register".[9] The scratchpad registers (scratchpad memory designated by numeral 1315 of Figure 13a)[10] have been incorporated in the central processing unit (CPU) which is a different structure from that of the system base structure located in the main memory module designated by numeral 102 of Figure 1.[11] Still another element of the hardware combination comprising the invention is a microprogrammed hardware control element[12] shown on Figures 13a and 13b of the Respondents' application,[13] which is commonly referred to as firmware.[14] The microprogrammed

[9]The phrases "scratchpad registers" and "scratchpad memory" are included in the preamble portion of the Respondents' combination claims and is also recited in the body of such claims so as to give life, meaning and vitality to the other elements recited therein. For a complete discussion of limitations as aplied to claim preambles, see *Kropa v. Robie,* et al, 187 F.2d 150, 88 USPQ 478 (1951).

[10]JA-112.

[11]JA-99.

[12]As stated on pages 19 and 20 in the authoritative book on microprogramming entitled, "Microprogramming: Principles and Practices", by Samir S. Husson, Prentice-Hall Inc.:

> "Microprogramming was proposed as an orderly technique for designing and organizing control signals which represent the states of the computer and the orderly transition between these finite states. This was a direct replacement of the classical sequential logic circuits which were designed to interpret a fixed data hardware environment. This view places microprogramming within the domain of the system designer."

[13]JA 112-113.

[14]Respondents' patent application defines "firmware" as that part of a hardware unit implementation which utilizes a form of microprogrammed control (JA-84) and defines "microprogram" as a set of machine codes used to implement the control function of a processor (JA-87). The authoritative sources relied upon by the Commissioner also recognize that firmware is a machine part. In the Journal of the Patent Office Society, Vol. 59, p. 737 it is stated that:

> "A generalized example of firmware is 'a small, easily replaceable part which is pre-punched or wired in such a way that when activated... cause[s] a particular sequence of computer operations to take place. . . .'"

hardware control element also includes hardware structure which is physically located within different parts of the computer.[15] Another claimed element, a hardware gate HG (reference numerals 1507 and 1514)[16] is disclosed in Figure 15b.[17]

The hardware control element in conjunction with the other elements of the invention enables the computer to perform the series of machine operations illustrated in the flow charts of Figures 14a through 14i and Figures 15b and 15c.[18] (The hardware control element may be likened to the cam of an internal combustion engine in that it is essential in carrying out the proper sequence of operations of the machine — it carries out the rule of action of the machine).[19] Other descriptions and illustrations of the Respondents' hardware combination are contained in the application, particularly Figures 5, 8 and 12.[20]

---

[15]"Each of the functional units within the computer includes decoding logic circuits for generating the requisite subcommands (control signals) specified by a control store word under the control of the system clock source." (JA 67-68). Additional structure interconnects the functional units and the microprogrammed control element and the decoding logic circuits and the control element JA-112, JA-113.

[16]JA-120.

[17]*Ibid.*

[18]JA 114-120. Flow charts are a shorthand method for disclosing machines as well as programs. Some typical machine patents utilizing flow charts for disclosure are as follows: U.S. Patent Nos. 3,329,937 (1967); 3,736,566 (1973); 4,183,084 (1980); 4,093,990 (1978) and 3,735,864 (1973).

[19]See *Robinson, The Law of Patents,* Sections 173 and 175 (1890).

[20]JA-102, 104, 111.

II.

WHAT THE INVENTION IS NOT.

The Commissioner has not understood the invention at any point in the history of this case.[21] He has alleged at various times that the invention is a program,[22] a mathematical algorithm and a method of calculation[23] and it is an old combination.[24] In his Brief For The Petitioner, he reiterates his basic theme that computer related inventions are mathematical.[25]

The cornerstone of his argument is that all digital computer machines are mathematical in nature and therefore nonstatutory subject matter under 35 USC 101. The Commissioner has stated in the record below:

> "Since digital computers normally operate in some numeral radix, binary, binary coded decimal, or the like, we consider the operation of Appellants' claimed invention to be mathematical."[26]

Aside from his bare allegations and misinterpretations of terms used by those skilled in the art utilized to disclose the invention,[27] the Commissioner has not identified where in

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[21]Refer to the plethora of erroneous statements by the Commissioner identified in Respondents' Appendix. R1a - R4a.

[22]PW 34a, 38a, 39a (The letters PW followed by a number indicate the page number in the Commissioner's Petition for aWrit of Certiorari to the United States Court of Customs and Patent Appeals).

[23]PW 29a.

[24]PW 5, 6, 26a, 27a.

[25]The Commissioner states: "[b]ecause a digital computer is designed solely to perform mathematical computations, any program that it can implement must necessarily be mathematical", p. 14.

[26]JA-202.

[27]Refer to Respondents' Appendix for the identification of some of the Commissioner's misinterpretations.

Respondents' application a computer program, a formula, method of calculation, a mathematical algorithm, a law of nature, an idea or a scientific principle is disclosed or claimed.[28] Hence, there is no basis in the record for his conclusion.

The Respondents' claims do not involve a mathematical algorithm; they do not involve any so-called "computer-implemented algorithm"—a phrase coined by the Commissioner. As a matter of fact, the Respondents' claims do not involve an algorithm or procedure of any kind.

One of the errors evident throughout the Commissioner's Brief is his misunderstanding and misuse of the term "algorithm". This Court has defined algorithm as "[a] procedure for solving a given type of mathematical problem."[29] The Commissioner, in coining the term "computer-implemented algorithm" attempts to encompass steps involved in both the creation of a machine and a mathematical algorithm.[30] This is absolutely wrong—both legally and logically.

A mathematical algorithm which brings to light for the first time a phenomenon which has always existed, e.g. Newton's formulation o the law of universal gravitation $F=mm/d^2$ is not patentable subject matter.[31] The algorithm merely

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[28]The board said that the claims do not *directly* recite a mathematical formula, algorithm, or method of calculation, but, nevertheless, held the claims to be mathematical in nature. As appears from the quoted portion of the board's opinion, the board regarded the fact that digital computers operate in some number radix as conclusive on the issue of whether the appealed claims recite a mathematical algorithm in the *Benson* and *Flook* sense. The board did not, however, direct attention to any specific formula it thought is utilized, or to what, if anything, the mathematical calculations alleged to be present in the claims are directed. JA-17.

[29]*Parker v. Flook*, 437 US at 585 note 1 (quoting *Benson*, 409 US at 65).

[30]See Brief for Petitioner, p. 15.

[31]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522, f.n. 15 (1978). "The underlying notion is that a scientific principle, such as that expressed by Respondent's [*Flook's*] algorithm, reveals a relationship that has always existed."

expresses the discovery, e.g. a law of nature. It does not describe a machine nor a portion thereof. The discovery is inseparable from the algorithm which brings to light what has always existed. The discovery therefore is the algorithm.

The Commissioner *cannot,* merely be coining a new term, extend this Court's definition of an algorithm to apply to something created by the art and industry of man which has *not* always existed. The act of man in creating a machine is separate and district from the act of expressing a law of nature by an algorithm. In a machine comprising a combination of elements, the elements are normally described by means of blueprints, flow charts and written explanations. If a nonmathematical algorithm were to be utilized in the disclosure of any of the elements of the machine, it could be likened to the blueprint or flow charts. However, when a patent is obtained for the overall machine combination, it does not preempt the use of any of the individual elements or the blueprints utilized in describing th. They are separable from the creation of the machine combination. Similarly no algorithm utilized in disclosing any element of the machine would be preempted and the public is free to use such algorithm. It too is also separate from the machine. The algorithm is not the machine.

It should further be noted that Respondents' invention is not a computer program of any kind. Computer programs are normally written by computer programmers to be executed by the computer to solve some user problem. They are typically embodied in punch cards[32] or magnetic tape.[33] Computer programs are generally sold or licensed separately and apart from the computer hardware, and circulate in commerce as independent products. The Commissioner, if he felt a program was disclosed and claimed, had ample opportunity in the proceedings below to resolve this factual question. On the contrary, he has admitted that the invention is a machine.[34]

[32]See Figure (a) JA-4.

[33]See Figure (b) JA-5.

[34]JA-3.

Nor is the claimed invention an old combination.[35] In support of this allegation the Commissioner is belatedly raising new factual issues clearly recognized as requiring resolution under 35 USC 102 or 35 USC 103 by citing the Carre et al application and the Coulter Patent No. 3,891,974 in his brief. These fact issues are not properly before this Court. Moreover the Respondents' claimed invention is patentably distinct over the newly cited references; it discloses and includes additional hardware not disclosed or suggested in the cited references.[36]

The Respondents' claims express the elements of their machine combination as means for performing a specified function and such claim language must be construed to cover the corresponding structure described in Respondents' specification and equivalents thereof as 35 USC 112 requires.

The Commissioner cannot ignore the Respondents' claim language and simply treat Respondents' invention as a process for the purpose of ignoring the interrelationship of the claimed machine elements upon which patentability of machine inventions is normally predicated.[37] The record

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[35]In the Manual of Patent Examining Procedures of the United States Patent and Trademark Office it is stated that:

> "The rejection on the ground of old combination (synonymous with 'exhausted combination') requires the citation of references. . . ."

[36]See pages 37-42, infra, for a detailed discussion of these factual issues.

[37]In *corning v. Bruden,* 56 US 252 at 257, 267 and 269 (1853), this Court articulated the fundamental difference between a process and a machine. It stated that when the result or effect was produced by chemical action or by the operation or application of some element or power of nature or of one substance to another, such modes, methods, or operations were called processes — not a machine. The Court further stated that a machine is a concrete or tangible thing consisting of parts or of certain devices and a combination of devices — a machine is not a principle or idea. Accordingly, when an inventor's specification describes a machine, it would be improper to construe the invention as being for a mere function, effect or result instead of being for a machine which is an authorized subject of a patent.

below shows that Respondents do not disclose or claim a result or the inherent function of a machine or an abstract idea as the Commissioner now alleges but rather a machine for producing a new or improved result.

Furthermore, the claimed invention is not an aggregation of elements such as an eraser being attached to one end of a pencil[38] where the individual parts do not cooperate to produce a new or improved result, i.e. improve the writing or the erasing. The Respondents' combination consists of various elements which cooperate with each other to improve the efficiency of a computer.[39]

III.

A SIMPLIFIED ANALOGY OF THE NATURE OF THE INVENTION.

The nature of the invention may be better understood with reference to an internal combustion engine analogy. Consider a hypothetical invention which when incorporated into an existing automobile engine improves the efficiency of that engine and provides a cleaner exhaust. It achieves this by injecting a preheated mixture of air and fuel to each cylinder of the automobile engine at the appropriate power stroke.

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[38] *Reekendofer v. Faber*, 92 US 347 (1875).

[39] In *In re Worrest*, 201 F.2d 930, 96 USPQ 381 at 381 (1953) it is stated:

> "Patentable combination may be present where there is correlation, cooperation or coordination resulting in mutuality of achievement of common purpose."

See also *Lincoln Engineering Co. of Illinois v. Stewart Warner Corporation*, 303 US 545, 58 S. Ct. 662 at 664 last column, last 7 lines, (1938) and *In re Gustafson*, 331 F.2d 905, 141 USPQ 585 (1964).

The hypothetical invention utilizes a new hardware combination claimed as comprising the following elements: (a) a centrally located preheating chamber; (b) an internal heating device in the chamber for preheating the air and fuel mixture; (c) metal tubes connecting the chamber to each cylinder of the existing automobile engine; (d) inlet and outlet valves in the preheating chamber for admitting and removing the air and fuel mixture; and (e) a control cam for actuating the valves.

The machine operations that this additional hardware combination performs in cooperation with the existing automobile engine are as follows: (a) opening an inlet valve to admit the fuel into the preheating chamber; (b) opening another inlet valve to admit air into the preheat chamber; (c) closing each of the inlet valves at appropriate times; (d) preheating the fuel air mixture to some specified temperature; and (e) opening the outlet valves in the connecting tubes so that each cylinder receives the preheated mixture at the appropriate time. It is clear that all of these operations are *machine operations* of this new claimed hardware combination. They are not machine operations of the existing automobile engine, and they do not comprise a computer program. These machine operations of this new claimed hardware combination are controlled by the cam — which is a hardware element and part of the new combination of hardware elements of the hypothetical combination invention.

The claimed combination comprises the (a) preheat chamber, (b) preheat apparatus, (c) connecting tubes, (d) valves and (e) cam. All of these elements are required to be attached to an existing automobile engine to provide greater mileage and cleaner burning fuel. The fact that a cam controls the machine operations of this new hypothetical

combination does not make the cam a program,[40] nor does it make the cam the sole inventive entity of the new claimed combination.

In evaluating this hypothetical invention under 35 USC 101, it must be considered as a whole. The arrangement of the elements and how they cooperate and function with each other to produce an improved result must be considered. It is the claimed combination that is the invention and not any one element included therein.[41] In *Flook* the Court reiterated its long standing directive that a "patent claim must be considered as a whole."[42]

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[40]"Every machine is characterized by its rule of action which resides within the machine itself." *Robinson, The Law of Patents,* Paragraphs 173 and 175 (1890).

The rule of action or mode of operation in this hyupothetical invention (supra) is embodied in the cam. The cam is part of the machine and must be considered as part of the combination. Without all of the elements described the cam performs no useful function. In this sense the mode of operation can be said, speaking loosely in the language of computer usage, to be "programmed" into the machine via the cam. It can similarly be said that the mode of operation of knitting machines, steam engines, metal working machines and endless other machines are "programmed" into the machine and comprise the rule of action of the machine. This does not make the machine a program as the Commissioner alleges. Neither does it make the cam a program.

Justice Matthers in speaking for the Supreme Court explained in *Electric Railroad Signal Co. v. Hall Railway Signal Co.,* 114 US 87, 55 S.Ct. 1069, 29 L. Ed. 96 (1858), (a case dealing inpart with mode of operation of a machine) that:

> "It thus clearly appears that the difference in this particular between the inventionclaimed . . . is a difference in the arrangement of the parts and in the principle of communication. . . ."

So it is with the Respondents' invention.

[41]See *Aro Manufacturing Co., Inc. et al v. Convertible Top Replacement Co.,* 365 US 336, 128 USPQ 354 at 355 (1961).

[42]*Parker v. Flook,* 437 US 584, 98 S. Ct. 2522 at 2528, (1978).

The Respondents' invention is analogous in that it comprises a unique combination of hardware elements that coact and function with each other to improve the efficiency and speed of a computer of which it is a part. One element of the claimed combination, a microprogrammed firmware control element, controls the machine operations of this new combination. This firmware control element is analogous to the cam of the hypothetical claimed combination invention. It is abundantly clear from the Respondents' specification that the firmware control element *alone* cannot be used with any existing computer as alleged by the Commissioner.[43] It is necessary that the whole claimed combination of elements including the various hardware registers, hardware structures and firmware control element be incorporated in a computer.

IV.

PATENT AND TRADEMARK OFFICE CONSIDERATION.

In the PTO the Respondents conclusively proved, and the PTO agreed, that their invention clearly distinguishes over the cited prior art — that it is new under 35 USC 102.[44] Respondents also conclusively proved, and the PTO agreed that their invention was described in full, clear, concise and exact terms as to enable any person skilled in the art to which it most closely pertains, to make and use the same.[45]

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[43]Brief for the Petitioner, p. 5.

[44]The Examiner's rejection under 35 USC 102 (JA-124) was removed in the Office Action of October 27, 1976 (JA-150-152) in view of Respondents' arguments. (JA-126-152).

[45]The Examiner's rejection under 35 USC 112 (JA-122-123) was removed in the Office Action of October 27, 1976 (JA-150-152) in view of Respondents' arguments (JA-135-143).

The Examiner finally rejected the Respondents' claim under 35 USC 101 as drawn to nonstatutory subject matter based on a misinterpretation of *Gottschalk v. Benson* and a misunderstanding of the invention. Without identifying a program, the Examiner merely stated that the:

> ". . . claims . . . set forth an invention *related* to the processing of data by a programmed computer." (Emphasis added).[46]

The Board of Appeals recognized that the invention as recited in Claim 1 consists of hardware structure in the form of registers or portions thereof and firmware.[47] The Board, however, ignoring the combination as a whole and the specific arrangement of the hardware elements claimed and how they cooperate with each other, has characterized each individual element except the hardware control unit (firmware) as old. It dissected the claimed combination invention down to only one element which it erroneously labeled a mathematical algorithm.[48] The Board, with its broad brush, characterized every digital computer machine as being mathematical and therefore nonstatutory under 35 USC 101, a most obvious misstatement of fact and law.

V.

CCPA CONSIDERATION

The Court of Customs and Patent Appeals in a unanimous decision reversed the Board of Appeals. The Court below

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[46]JA-123.

[47]JA-198-199.

[48]JA 202.

rejected the reasoning of the Board on the basis that such reasoning leads to the conclusion that any computer related invention must be regarded as mathematical in nature, a conclusion which is not compelled by either *Benson* or *Flook.*[49] No difference was seen between Respondents' claimed invention and a strictly mechanical adding machine which is certainly statutory if claimed in a manner which does not embrace any particular calculation that the machine is capable of making.[50]

As concerns the firmware, the CCPA stated:

> "If Appellants were claiming the information embodied in the firmware or the firmware itself, per se, a different case would be presented. We express no opinion on the statutory nature of such an invention, a question not before us. Appellants are claiming a combination of hardware elements, one of which happens to be a portion of the computer's control store microprogrammed in a particular manner. It is this subject matter with which we must deal."

Pursuant to this Court's reasoning in *Flook,* the Court below looked to the specification to determine the nature of the invention. After careful analysis the CCPA concluded the following:[51]

> "We disapprove the board's distillation of Appellants' claim down to the information contained in the firmware in order to hold it nonstatutory. The invention is not claimed in that manner, and, in this case, we see no reason to view the claim format as a subterfuge for masking the presence of an essentially nonstatutory invention."

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[49]JA-17.

[50]*Ibid* at 18-19.

[51]JA-19.

SUMMARY OF ARGUMENT

This case presents a narrow question of statutory interpretation of 35 USC 101.

The Respondents applied for a patent for a unique computer machine. Throughout the prosecution of this case the Respondents have insisted that their invention is a machine. The Court below agreed with them.[52] Even the Commissioner agreed that the invention is a machine.[53] It can hardly be denied now that the Respondents' claimed invention is a machine. The question then becomes, is it a machine within the meaning of 35 USC 101 — i.e. is it a machine created by the art and industry of man which has not always existed.[54]

In construing 35 USC 101 this Court has recently observed that:

> "Congress plainly contemplated that the patent laws would be given wide scope" [and that] "The relevant legislative history also supports a broad construction . . . . The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to 'include anything under the sun that is made by man.' "[55]

The Respondents' invention is man-made. It has not always existed, and the Commissioner has not shown otherwise. The Court below noted the Commissioner's admission that Respondents' claims do not recite a mathematical formula, algorithm, or method of calculation.[56]

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[52]JA-18.

[53]JA-3.

[54]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2527, footnote 15, (1978).

[55]*Diamond v. Chakrabarty*, ____ US ____, No. 79-136 (1980), at p. 5.

[56]JA-17.

Furthermore, the Commissioner has failed to show that a scientific principle, law of nature or abstract idea is disclosed.

The Commissioner has obviously misunderstood and misconstrued the Respondents' invention. This is illustrated by the more substantive errors made by the Commissioner in his Brief For The Petitioner, some of which are identified and corrected in the Respondents' Appendix.[57]

The broad public policy issues raised by the Commissioner regarding the patentability of computer programs are properly matters for Congress and need not be considered by the Court in this case.

In both *Gottschalk v. Benson,* 409 US 63 and *Parker v. Flook,* 437 US 584, this Court's attention was riveted on a phenomenon which always existed; a phenomenon which was discovered by the inventors, expressed as a mathematical algorithm, and merely brought to light by them. In *Benson* this Court correctly held "the discovery of a novel and useful mathematical formula may not be patented." In *Flook,* this Court correctly held that "an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under Section 101." The *Flook* invention like a law of nature was not "the kind of discovery that the statute was enacted to protect", that is, it represented a "relationship that has always existed".[58] Conversely, any process, machine, manufacture or composition of matter which is "made by man" must fall within one of the categories of general statutory subject matter of 35 USC 101.

The Respondents' invention plainly qualifies as patenta-

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[57]See pages R1a - R4a, *infra.*

[58]*Parker v. Flook,* 437 US 584, 98 S. Ct. 2522 at 2527 (1978).

ble subject matter under Section 101 based on the decisions of this Court. It is a nonnaturally occurring machine; a product of human ingenuity. It is part of the unique structure of a completely new computer system designed in response to the needs of the competitive marketplace for a more efficient computer.

In spite of the vast and compelling differences between the Respondents' claimed machine invention and the mathematical formulae of the process claims addressed in *Flook* and *Benson,* the Commissioner still attempts to force Bradley's invention into a nonstatutory procrustean bed. He misapplies *Flook* and *Benson* to reach his erroneous conclusion. In analyzing the machine type of invention for which patent protection is sought, he disregards, contrary to the holdings of this Court in *U.S. v. Adams,* 383 US 39 (1966) and in *Parker v. Flook,* 437 US 584 (1978)[59] the features relied upon for patentability for such statutory class of inventions such as the arrangement of the elements claimed and how each element coacts and functions with other elements of the claimed combination to produce a new or improved result. He dissects the Respondents' claimed combination of elements by alleging that each individual element is old and then argues that a nonstatutory idea remains. Utilizing this erroneous rationale, any invention ever invented can be held to be nonstatutory under Section 101. For example, Edison's incandescent lamp can be

[59]While the Commissioner now argues that Respondents' hardware arrangement was disclosed in an earlier obtained patent (see discussion *infra,* pps. 38-42), this argument masks the Commissioner's basic approach of focusing in on a specific element of a machine combination claim regarded as the novel feature and distilling it down to the idea involved.

reduced to its incandescent principle. One need merely hold that a glass bulb was individually old; the carbonified filaments were individually old; and the vacuum technology was old. Then using the Commissioner's erroneous rationale, the only remaining feature of the incandescent lamp is the principle of incandescence which is a natural law. Hence, Edison's epic invention would have been held nonstatutory by the reasoning of the Commissioner.

This Court has flatly rejected such illogical reasoning. In *Aro Manufacturing Co., Inc., et al v. Convertible Top Replacement Co., Inc.,* a case including the infringement of a combination invention, the Court stated:

> "Combination patent covers only the totality of the elements in the claim; no element, separately viewed, is within the grant; there is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention in a combination patent; no element, not itself separately patented, that constitutes one element of the combination patent is entitled to patent monopoly however essential it may be to patented combination and no matter how costly or difficult replacement may be."[60]

The Respondents' invention is a combination of hardware elements and must be viewed in the totality of its elements. No single element of the combination is sought to be patented.

To bypass his statutory duty of examining the Respondents' invention on its merits, the Commissioner is now apparently attempting to import Section 102 and 103 requirements (novelty and nonobviousness) into Section 101. He is also attempting to import a prior invention question into Section 101. No record below has been

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[60] *Aro Manufacturing Co., Inc., et al v. Convertible Top Replacement Co., Inc.*, 365 US 336, 128 USPQ 354 at 355 (1961).

established for enabling a determination of these questions. This case does not involve these other conditions and requirements of the patent laws.

ARGUMENT

VI.

THE GOVERNMENT SEEKS BY THIS CASE TO PROHIBIT PATENTS FOR COMPUTER RELATED INVENTIONS.

The Commissioner's insistence on a narrow construction of 35 USC 101 to exclude computer machine inventions is contrary to the Constitutional mandate, the intent of Congress and the decisions of this Court.[61] Without any supporting factual evidence, the Commissioner has now alleged the Respondents' invention is a computer program. This erroneous conclusion is based on a serious misunderstanding of the invention.[62] The Commissioner's unsound position in this case can only be viewed as

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[61]*Diamond v. Chakrabarty* ___ US ___ (1980), Opinion No. 79-136 at 11, 12. "The subject matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of Science and the Useful Arts' with all that means for the social and economic benefits envisioned by Jefferson. . . .

Nothing in *Flook* is to the contrary . . . *Flook* did not announce a new principle that inventions in areas not contemplated by Congress when the patent laws were enacted are unpatentable per se.

To read that concept into *Flook* would frustrate the purpose of the patent law. . . ."

[62]Some of the numerous substantive errors of the Commissioner are identified and corrected in the Respondents' Appendix R1a - R4a.

another step in his repeated attempts to obtain a broad holding from this Court that computer related inventions are not patentable. This attempt by the Commissioner to obtain a restrictive interpretation of Section 101 to solve his administrative difficulties in the Patent and Trademark Office[63] cannot be condoned.

This Court has recognized that the patent laws enacted by Congress do promote productive effort which, in turn, improves the economy, increases employment and makes better lives for U.S. citizens.[64] The Court has also observed that the patent system has three objectives: (a) to foster and reward inventions; (b) to promote the disclosure of inventions; and (c) to assure that ideas (inventions) already in the public domain remain there for free use.[65] Thus the patent system functions by adding to the sum of useful knowledge.[66]

The Respondents have advanced the state of the computer art with their invention. They have completely disclosed their invention in the specification for the benefit of the public. They do not seek to remove anything from the public domain. Moreover, the grant of a patent would not remove from the public anything it had freely enjoyed prior to the grant of such patent. The type of invention created by the Respondents — computer machines — has traditionally been considered statutory subject matter.[67] The restrictive

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[63]See Commissioner's Petition for a Writ of Certiorari to the United States Court of Customs and Patent Appeals, p. 13.

[64]*Kewanee Oil Company v. Bicron Corp.*, 416 US 470, 480 (1974).

[65]*Sears, Roebuck & Company v. Stiffel Company*, 376 US 225, 228-231 (1964).

[66]*Great Atlantic & Pacific Tea Company v. Supermarket Equipment Corp.*, 340 US 147, 152 (1950).

[67]See patents classified in PTO Classes 340.-172.5 and 364.

interpretation of Section 101 espoused by the Commissioner would, if followed by this Court, effectively invalidate all of these existing U.S. patents and prohibit issuance of future patents on computer machines. Congress has expressly renounced such a narrow construction of Section 101.[68]

VII.

ENUMERATED SUBJECT MATTER IN 35 USC 101 IS STATUTORY SUBJECT MATTER, PROVIDED IT IS A CREATION OF MAN AND DOES NOT PREEMPT SOMETHING WHICH HAS ALWAYS EXISTED.

A review of the history and basic concepts of the Patent Act since 1790 which eventually culminated in the 1952 Patent Act, makes it clear that 35 USC 101 is concerned with statutory subject matter, and not with a question of novelty. For subject matter to be statutory under Section 101, it must not only fall in one of the categories enumerated but it must be a creation of man and must not preempt something which has always existed. It is only in this sense that the word "new" has been imported into Section 101.[69]

[68]*Diamond v. Chakrabarty,* ____ US ____ (1980), Opinion No. 79-136 at 5.

[69]*Diamond v. Chakrabarty,* ____ US ____ (1980), Opinion No. 79-136, at 6. "Thus, a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are 'manifestations of . . . nature, free to all men and reserved exclusively to none.' " *Funk, supra,* at 130.

On the other hand, 35 USC 102 pertains to the novelty of subject matter found to be statutory under Section 101. A statutory invention is required to be further evaluated as to novelty and unobviousness over prior art inventions of others under 35 USC 102 and 103.

The First Congress, sitting in its second session, exercised its delegated power by enacting the Patent Act of 1790.[70] Section 1 of the Act, the precursor of 35 USC 101, provided for patents to be issued to:

> "Any person or persons . . . [that] hath or have invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used. . . ."

This section of the Act was further refined 3 years later by the Patent Act of 1793. The word "new" was included and the phrase "not known or used before the application" was added in the paragraph which provided for patents to be granted to:

> "Any person or persons . . . [that] have invented any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement on any art, machine, manufacture, or composition of matter not known or used before the application. . . ."

The pertinent part of Section 6 of the 1836 Patent Act which parallels Section 1 of the 1793 Act was enacted as follows:

> "And be it further enacted, that any person or persons having discovered or invented any new and useful improvement on any art, machine, manufacture, or composition of matter, not known or used by others before his or their discovery or invention thereof, and not at the time fo application for a patent, in public use

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[70] 1 Stat 109, April 10, 1790.

> or on sale, with his consent or allowance, as the inventor or discoverer; and shall desire to obtain an exclusive property therein, may make application in writing to the Commissioner of Patent, expressing such desire and the Commissioner, on due proceedings had, may grant a patent therefor."

This Act included language similar to the 1793 Act — but sets forth conditions and requirements relating to novelty— "not known or used 'by others' before his or their discovery or invention. . .".

The 1952 Patent Act in essence separated Section 6 of the 1836 Act into two separate and distinct sections, one relating solely to statutory subject matter and the other relating to novelty.[71]

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[71]The content of Section 101 of the 1952 Act was included in Section 4886 of the Revised Statutes (35 USC 31, 1946 ed.) which stemmed from Section 24 of the Patent Act of 1870. The language in section 6 of the Patent Act of 1836 was practically the same as that of 1870 in most respects, although it was still in terms of authority to grant a patent rather thaen the right to obtain a patent. The language similar to Section 6 of the 1836 Act was split into two sections and included in Title 35 as follows, Section 101 relating to the subject matter for which patents may be obtained:

> "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

and Section 102 defining statutory novelty and stating other conditions for patentability.

> "A person shall be entitled to a patent unless — (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent . . . or (b) the invention was described i.. a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent. . . ."

It is illuminating to note that despite innumerable revisions and amendments to the Patent Acts of 1790, 1793, and 1836, that the original language pertaining to categories of patentable subject matter remains remarkably similar.[72]

Although all of the Patent Acts refer to invention or discovery, or both, it does not follow that every invention or discovery is patentable subject matter under 35 USC 101.[73] No discovery of something that has always existed, but was not known until brought to light by the discoverer will entitle him to a patent under 35 USC 101.[74] Laws of nature, physical phenomenon and abstract ideas, though they may be discovered, have been held not patentable because they have always existed—they are not new.[75] It is only in this sense, that something has not always existed, that "new" has been imported into or is still residuum in Section 101.[76] something has not always existed, that "new" has been

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[72]However the following definitions were added: 35 USC 100(a) defines "invention" to mean invention or discovery while 35 USC 100(b) defines "process" to mean process, art or method and to include a new use of a known process, machine, composition of matter or material.

[73]Webster's New International Dictionary, Second Edition, unabridged at p. 1305 defines Act of Inventing as "[d]evising or contriving up that which has not before existed, as the invention of gunpowder", whereas on page 745 it defines Discover as follows: "To obtain for the first time sight or knowledge of, as of a thing existing already, but not perceived or known."

[74]"An example of such a discovery [of a scientific principle] was Newton's formulation of the law of universal gravitation, relating the force of attraction between two bodies, F, to their masses, m and m', and the square of the distance, d, between their centers, according to the equation $F\text{-}mm'/d^2$. But this relationship always existed — even before Newton announced his celebrated law. such 'mere' recognition of a theretofore existing phenomenon or relationship carries with it no rights to exclude others from its enjoyment." *Parker v. Flook*, 437 USC 584, 98 S. Ct. 2522 (1978).

[75]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2528 (1978).

imported into or is still residuum in Section 101.[76] Conversely, "even though a phenomenon of nature or mathematical formula may be well known, an inventive application of it by man may be patentable".[77] This Court has repeatedly held that the method or means of application of a principle or law of nature producing a useful result is the proper subject for a patent.[78] Deller expresses this concept as follows:

> "It is only when the discoverer has gone beyond the mere domain of discovery, and has laid hold of the new principle, force or law and connected it with some particular medium or mechanical contrivance by which, or through which, it acts upon the material world, that he can secure the exclusive control of it through the Patent Act. He then controls his discovery through the means by which he has brought it into practical action, or their equivalent, and only through them. It is an invention, although it embraces a discovery . . . . Discovery can be made of a law of nature, for instance, but it can never be invented. When discovered, a law of nature may be utilized in an invention relating to

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[76]As stated by Mr. Federico, the architect of the 1952 Patent Act,

> "The question of novelty to others is not particularly relevant at this point as persons may, and often do, invent things which have been made before by others."

"Section 101: Subject Matter for Patents", by P.J. Federico in The Law of Chemical, Metallurgical and Pharmaecutical Patents, Howard I. Forman, Editor, published by Central Book Company, New York (1967).

Note also that Webster's Collegiate Dictionary, Fifth edition defines "new" as "having existed, or having been made, but a short time."

Thus the conditions and requirements of novelty are only relevant under 35 USC 102.

[77]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 (1978).

[78]*Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 US 45 (1923).

> patentable subjects such as processes, machines, manufactures, or compositions of matter. It is the invention of one or more of these subjects, for the purpose of utilizing a law of nature, and not the discovery of that law, that may be rewarded with a patent."[79]

There is a long-standing recognition of patentable subject matter if the inventor "connects a discovery with some particular medium or mechanical contrivance."

Similar treatment has been accorded to ideas. While a mere idea is not patentable, the means for carrying out an idea is patentable. In such a case the invention consists of the conception of the idea and the means for putting it in practice and producing the desired result.[80] Respondents note that the Commissioner has articulated this same view on the patentability of ideas.[81]

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[79]Deller's Walker on Patents, Second Edition, Vol. 1, p. 102.

[80]*Mayo Knitting Machine & Needle Co. v. E. Jenckes Mfg. Co.*, 133 F. 527, R.I. (1904); *Kruger v. Whitehead*, 153 F.2d 238, C.C.A. Cal. 91946), *cert. denied*, 332 US 774, 58 S. Ct.; *International Curtis Marine Turbine Co. v. William Cramp & Sons Ship & Engine Bldg. Co.*, 202 F. 932, Pa. (1913) reversed on other grounds, 228 US 6545, 33 S. Ct. 722

[81]"Since the first patent law was enacted in 1790, the patent system has been directed solely to the pragmatic application of ideas. Thus, patents have been issued only with respect to specific and tangible machinery, articles of manufacture, chemical and other physical compositions and processes for making or using such machinery, articles of manufacture and compositions in a specific way. These four classes alone — 'machines', 'articles of manufacture', 'compositions' and 'processes' for making or using them, 35 USC 101—are the categories of statutory subject matter. Principles and ideas, as contrasted with the specific and tangible application of those ideas to a specific use, have always constituted nonstatutory subject matter which cannot qualify for the monopoly grant embodied in a patent, *Leroy v. Tatham*, 14 How. 156, 174-175; *rubber-Tip Pencil Co. v. Howard*, 20 Wall. 498, 507; *Mackay Radio & Tel. Co. v. Radio Corporation*, 306 US 86, 94." Brief for the Petitioner, in *Gottschalk v. Benson*, pp. 17-18.

This view is in keeping with Jefferson's concepts relating to ideas who, as Secretary of State at the time of the enactment of the Patent Acts of 1790 and 1793, was one of the "Patent Board" members[82] who profoundly influenced the fundamental course of the Patent Laws.

The concept articulated by Jefferson that an application of a principle or the reduction to practice of an idea can be patented has been continually affirmed by this Court in such landmark cases as: *O'Reilly v. Morse,* 56 US 62 (1853); *The Telephone Cases,* 126 US 1, (1888); *Eibel Process Co. v. Minnesota & Ontario Paper Co.,* 161 US ____ (1923) *Funk Bros. Seed Co. v. Kalo Co.,* 333 US 127 (1948); *Gottschalk v. Benson,* 409 US 63 (1972); *Parker v. Flook,* 437 US 584 (1978); and *Diamond v. Chakrabarty* ____ US __ (1980) Opinion No. 79-136.

In these cases the Court's attention was clearly focused on phenomena which is required as having always existed, i.e. ideas, laws of nature, scientific principles, or mathematical formulae. In deciding *Flook,* this Court correctly perceived that the mathematical algorithm involved was "a procedure for solving a given type of mathematical problem" and therefore a discovery of something which always existed and

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[82] "The power to grant patents under the Patent Act of 1790 was completely vested in a board or commission consisting of three members; The Secretary of State, the Secretary of War, and the Attorney General . . . . Thomas Jefferson was also an inventor of considerable merit, having invented a number of ingenious devices. . . . Jefferson became an enthusiastic supporter of the patent system, but before his intimate contact with its beginnings, *he was opposed to monopolies of all kinds* . . . . Subsequent experience, including his personal contact with patents, convinced him of the importance of th patent system, and that an inventor should be rewarded by a limited monopoly . . . ." (Operation of the Patent Act of 1790, by P.J. Federico, Journal of the Patent Office Society, April, 1936, Vol. XVIII, No. 4.

in that sense "a familiar part of the prior art". That is, it disclosed and claimed only the discovery of a formula which like a law of nature is not the kind of discovery that the patent statutes were enacted to encompass. The relationship codified into mathematics by *Flook* always existed but was not known until he brought it to light.[83]

The Respondents' invention in this case is not a mathematical formula but a machine. Stated differently, it is not for a principle (idea) but for a machine which carries a principle (idea) into effect.[84] The invention has not always existed; it

[83] *Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 and 2527 and footnote 15 (1978).

> "The rule that the discovery of a law of nature cannot be patented rests, not on the notion that natural phenomena are not processes, but rather on the more fundamental understanding that they are not the kind of "discoveries" that the statute was enacted to protect. . . .
>
> "The underlying notion is that a scientific principle, such as that expressed in Respondents' algorithm, reveals a relationship that *has always existed.*"

[84] The above statement is consistent with the reasoning of the English case of *Neilson, et al v. Hasford*, Webster's Patent Cases 273 (1844) relied upon by this Court in the *Morse* case and in *Flook*. In *Neilson* the Court reviewed the specification of a patent entitled "An invention for the improved application of air to produce heat in fires, forces and furnaces where bellows or other blowing apparatus are required". One objection raised by the defendants charged with infringement of the patent was that the specification did not sufficiently ascertain and describe the nature of the invention. *Plaintiffs' counsel argued:* It has been suggested that this is a patent merely for a principle; but that is not so; it is a patent for the mode of carrying a principle into effect. The mode of heating air and increasing combustion was known before; this patent is taken out for the novel application of air so heated to certain useful purposes - for passing the air in a heated state, instead of a cold state as formerly, into furnaces; and the mode of operation is by interposing a closed vessel, exposed to heat, between the blowing apparatus and the furnace. That is a sufficiently practical discovery to be the subject of a patent, according to all the authorities: *Minter v. Wells* (1 C.M. &

(continued)

was not known in the Section 101 sense — it is new. Accordingly, it is patentable subject matter under Section 101.

VIII.

THIS COURT IN *BENSON, FLOOK* AND *CHAKRABARTY* REAFFIRMED THAT INVENTIONS MADE BY MAN ARE PATENTABLE SUBJECT MATTER UNDER 35 USC 101

In interpreting the subject matter that is patentable under Section 101, this Court noted that Congress intended that the patent law should be given wide scope.[85] This intent is set forth in the Committee Reports accompanying the 1952 Patent Act and in the testimony of P.J. Federico, a principal draftsman of the 1952 Act. Specifically, "The Committee Reports . . . inform us that Congress intended statutory

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(footnote continued from preceding page)

R505), *Hornblower v. Boulton* (8 T.R. 98), Webster on Patents, p. 136.

The English Court concluded:

Then, taking the construction of this specification on ourselves, as we are bound to do, it becomes necessary to examine what the nature of the invention is which the plaintiff has disclosed by this instrument. It is very difficult to distinguish it from the specification of a patent for a principle, and this at first created in the minds of some of the Court much difficulty; but, after full consideration, we think that the plaintiff does not merely claim a principle, but a machine embodying a principle, and a very valuable one. We think the case must be considered as if, the principle being well known, the plaintiff had first invented a mode of applying it by a mechanical apparatus to furnaces; and his invention then consists in this - the interposing a receptacle for heated air between the blowing apparatus and the furnace.

[85] *Diamond v. Chakrabarty* ____ US ____, Opinion No. 79-136 at 5.

subject matter to 'include anything under the sun that is made by man.' This same language was employed by P.J. Federico, . . . in his testimony . . . 'Under Section 101 a person may have invented a machine or manufacture, which may include anything under the sun that is made by man. . . .'[86] The Court also reiterated that laws of nature, physical phenomenon and abstract ideas are not patentable, citing *Flook* and *Benson* among other decisions.

It should be noted that the inventions before the Court in *Benson* and *Flook* were mathematical formulae.[87] In determining that *Flook's* invention was not the kind of discovery that the statute was enacted to protect, the Court noted that the "underlying notion is that a scientific principle such as that expressed in Respondent's [Flook's] algorithm, reveals a relationship that has always existed."[88] This is consistent with the proposition that in granting patent rights the public must not be deprived of any rights that it previously enjoyed.[89] In *Benson*, the Court correctly noted that the process claimed was an attempt to patent an abstract idea and that the public's right to use the mathematical formula had to be preserved.[90]

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[86]*Diamond v. Chakrabarty* ____ US ____, Opinion No. 79-136 at 5. References to legislative history have been deleted from the quoted language.

[87]"The only novel feature of the method is a mathematical formula. In *Gottschalk v. Benson*, 409 US 63, 175 USPQ 673, we held that the discovery of a novel and useful mathematical formula may not be patented. The question in this case is whether the identification of a limited category of useful, though conventional, post-solution applications of such a formula makes Respondent's method eligible for patent protection." *Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2527 (1978).

[88]*Ibid* at note 15, Brackets added.

[89]P. Rosenberg, Patent Law Fundamentals, Section 4 at 13 (1975).

[90]*Gottschalk v. Benson*, 409 US 63 (1972).

The Respondents' case, as did *Flook Benson* and *Chakrabarty* turns entirely on the proper construction of Section 101 which sets forth the subject matter that is eligible for patenting. Section 101 does not involve the issues of novelty and obviousness that arise under Sections 102 and 103. This court in *Flook* made it clear that in interpreting 35 USC 101, the "obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is in fact new or obvious."[91]

In construing Section 101 in *Flook* this Court carefully reviewed the patent application and concluded:

> "The patent application does not purport to explain how to select the appropriate margin of safety, the weighting factor, or any of the other variables. Nor does it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit."[92]

Based upon this evaluation, the Court concluded that *Flook's* process invention was unpatentable subject matter under 35 USC 101 because the invention considered as a whole only pertains to subject matter that has always existed. The formula disclosed was assumed not to be new; it was treated as a familiar part of the prior art. Since the Respondents in *Flook* "had not challenged the examiner's finding that, the formula is the only novel feature of Respondents' method"[93] their application treated as a whole contained no patentable subject matter under 35 USC 101.

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[91]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2527 (1978).

[92]*Ibid* at 2524.

[93]*Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2525.

Respondents submit that the record below establishes that the Commissioner has admitted that Respondents disclose and claim a "machine" invention and not a program.[94] The record also indicates that the Respondents have disclosed the hardware elements of their invention in sufficient detail to satisfy the requirements of 35 USC 112.[95] It is obvious that the Respondents' invention was created by the art and industry of man. Before they conceived and implemented their invention, it did not exist. When they invented it they advanced the state of the art and disclosed it in their specification thereby adding to the sum of useful knowledge. Thus there is no benefit that the public previously enjoyed and which would be taken away by the granting of a patent for the Respondents' invention.

Because complex technological advances (e.g. micro-programmed control elements) make it difficult for unskilled persons to identify differences in machine structure, such difficlties should not be used as the basis for concluding that an invention not fall within one of the statutory classes of 35 USC 101. Historically, this Court has always recognized that even the slightest structural change can form the basis of patentability from both a prior art point of view as well as from an inventorship point of view. As Justice Bradley commented when he placed Edison in his rightful place as the inventor of the incandescent lamp:

> "It seems to us that they (Sawyer and Man) were following a wrong principle — the principle of small resistance in an incandescing conductor and a strong current of electricity; and that the great discovery in the

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[94]JA-3.

[95]See Joint Appendix pages 151-152, where the Examiner withdrew his rejection of claims under 35 USC 112.

art was that of adapting high resistance in the conductor with a small diminution in the strength of the current. This was accomplished by Edison in his filamental thread-like conductors. This was really the grand discovery in the art of electric lighting without which it could not have become a practical art for purposes of general use in houses and cities."[96]

In 1895, this Court affirmed the decision of the lower Court in the McKeesport case.[97]

Concomitantly, it can be said that Fleming added only one small wire to Edison's incandescent lamp to create his vacuum tube detector, known as the "Fleming valve". The Fleming invention was followed by the efforts of deForest, who added merely a third wire midway between the two elements of "Fleming's valve". These small, barely discernible changes in structure gave birth to patentable inventions which revolutionized the electronics industry and greatly benefited mankind.

Historically, this Court in regard to assessing allegations that an invention claimed is not new in the case of combination inventions has required examination of the invention of the combination as a whole rather than any one ingredient or element.[98] Further, when there were allegations

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[96]*Edison*, His Life, His Work, His Genius, by William Adams Simonds, Blue Ribbon Books Inc., New York, Copyright 1934 by the Bobbs-Merrill Company.

[97]In *Consolidated Electric Light Co. v. McKeesport Light Co.*, 159 US 465, 16 S. Ct. 75 (1895), claims of the Sawyer-Man Patent No. 317,076 covering the use of all fibrous and textile materials for incandescent conductors were held to be void.

[98]In the case of *Ryan, et al v. Goodwin, et al*, 3 Sumner C.C.R. 514 (1839) involving an infringement of a patent for a new and useful improvement in the manufacture of friction matches for the instantaneous production of light in the point of defense that the

(continued)

that the invention claimed involved a scientific principle or law of nature this Court employed a similar examination to ensure that claims were not directed to something that nature created, but rather that the invention was for a human accomplishment or creation, the construction of something which did not always exist before.

Contrary to this Court's holding in *Flook*, the Commissioner has ignored key hardware elements of Respondents' unique combination claims not disclosed in any references cited by him.[99] He further characterizes each individual element as old. He then alleges that Respondents' apparatus is old in the art[100] and ignores the arrangement and cooperation of the individual hardware elements with each other in mutually achieving an improved result.[101]

To illustrate the error of Commissioner's reasoning by analogy, assume that one is considering the following old elements: (a) wheels, (b) shafts, (c) rope, and (d) a frame.

A first combination which can be claimed is a cart that is

(footnote continued from preceding page)

invention claimed is not new stated: As to the first point, it is mainly question of fact. It is certainly not necessary, that every ingredient, or, indeed that any one ingredient used by the patentee in his invention, should be new or unused before the purpose of making matches. The true question is whether the combination of materials by the pantee is substantially new. Each of these ingredients may have been used for matches, or combined with other materials for other purposes. But if they have never been combined together in the manner stated in the patent, but the combination is new, then, I take it, the invention of the combination is patentable.

Additionally, see *U.S. v. Adams, et al*, 383 US 39, 86 S. Ct. 708 (1966) and *Aro Manufacturing Co., Inc., et al, v. Convertible top Replacement Co., Inc.*, 365 US 336, 128 USPQ 354 (1961).

[99]See discussion pps. 40, 41, *infra*.

[100]JA 182-183.

[101]JA-200.

constructed with the wheels, shaft and frame to be pulled along by the rope.

A second claimable combination is a system of pulleys constructed with the wheels, shaft, frame and rope to lift large weights.

A third combination is a steering mechanism constructed with the wheels, shaft, frame and rope to steer a boat.

All of these combinations have the same well known elements. Each element performs no new function. The wheels turn. The shaft supports the wheels. The frame supports the shaft. The rope transmits force. However, each of these elements cooperate with each other to produce a new or improved result. What gives uniqueness to each combination is the arrangement of these known elements with respect to each other and how they cooperate and function with each other, ie., how they are brought together.[102] The proper approach to analyzing combination inventions was eloquently stated by Judge Learned Hand as follows:

> "Substantially all patentable inventions are for combinations of old elements and what counts in determining whether a patentable invention has been made is the selection, out of all their possible permutations, of that new combination which will be serviceable."[103]

If the claimed arrangement of elements and how they cooperate with each other can be ignored by the Commissioner and no prior art need be cited, it is clear that he could, with the same defective logic, hold as nonstatutory any and all combination inventions.

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[102]This Court in *U.S. v. Adams*, 383 US 39 (1966) said:

> "It begs the question . . . to state merely that magnesium and cuprous chloride were individual known battery elements. If such combination is novel, the issue is whether bringing them together as taught by Adams was obvious in the light of prior art.

[103]*Safety Car Heating & Lighting Co., Inc. v. General Electric Co., et al*, 155 F.2d 937 (1946).

IX.

THE COMMISSIONER IS ASKING THIS COURT TO MAKE FINDINGS ON FACT ISSUES FOR WHICH NO FACTUAL RECORD HAS BEEN DEVELOPED.

1. There Is No Finding Of Fact On The Record That Any Program Is Disclosed or Claimed By Respondents

The Commissioner has grounded his arguments on a false premise — that Respondents' machine is a program. He has educed no facts to support this premise other than his bare allegations and convoluted reasoning. To attempt to convince this Court that the machine is a program he has disregarded *U.S. v. Adams*[104] and *Safety Car Heating & Lighting Co., Inc. v. General Electric Co., et al*[105] and dissects the invention to one element — the firmware control element — and considers it independent of all of the other claimed elements.[106]

He erroneously alleges that the firmware is a "computer

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[104]See page 36 *supra*, footnote 102.

[105]See page 36 *supra*.

[106]When the type of Respondents' invention claimed has been implemented totally in hardwired circuits, it has been regarded as statutory subject matter under 35 USC 101. The following U.S. Patents are examples of hardwired implementations of similar types of inventions classified in the same technical classes 340, 172.5 and 364 as the Respondents' inventions: 3,105,143; 3,454,933; 3,454,931; 3,425,039; 3,323,110; 3,522,589; 3,344,404; and 3,564,504. Additionally, the following U.S. Patents involve similar types of inventions implemented in "firmware": 3,400,371 and 4,028,670. There are numerous patents which have issued to date on Respondents' type of invention since the development of computer technology.

program that regulates the internal operation of the computer," but he has not shown where in the Respondents' application any computer program is disclosed or claimed. He has not even defined a computer program.

Utilizing the internal combustion engine analogy supra on page 10 of this Brief and applying the Commissioner's erroneous reasoning to it, the combination of hardware can be reduced to the hardware "cam" as the sole novel feature. The cam is then erroneously characterized as a program embodying merely an idea and accordingly is unpatentable. Thus, a hardware element utilized as one element of a combination can be magically transformed by the Commissioner's convoluted reasoning into a program which has never been disclosed or claimed.

2. The Commissioner Seeks To Raise New Fact Issues Before This Court For Which There Are No Findings Of Fact On The Record

In a belated attempt to show that the invention is not novel, he for the first time during the entire prosecution introduces the related patent application of Claude Carre et al Serial No. 528,951 and U.S. Patent No. 3,891,974 to Brent W Coulter, et al, both identified by the Respondents in their application.[107] This importation of novelty regarding the inventions of others into 35 USC 101 can only be viewed as a further and alternate attempt to distill the invention to some alleged unpatentable part, principle or idea.[108]

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[107]Coulter's patent incorporates by reference the Carre, et al application and issued as a patent subsequent to the filing of Respondents' application. Hence any disclosure therein was not known to the public at the time of filing of Respondents' patent application.

[108]See discussion of alternate modes of Commissioner's distillation of the invention on pages 18, 19 *supra*.

The Respondents incorporated by reference the application of Claude Carre into their application to satisfy the enabling and best mode requirements of 35 USC 112. Both Claude Carre and Coulter worked along with Bradley and Franklin and others in developing the Series 60, Level 64 computer. Both Claude Carre, et al and Coulter et al created inventions which are separate and distinct from Respondents' invention. The patent application covering Carre's invention was subsequently abandoned.

Introducing Carre's abandoned patent application and the Coulter patent for the first time in the Commissioner's brief is improper under Rule 21.1a of the Rules of the Court.[109] Furthermore the resolution of these new fact questions raised by the Commissioner of novelty and prior invention cannot be made by the mere introduction of these documents and without access to the facts and circumstances attendant to these documents. Moreover, such questions are not relevant to the 35 USC 101 issue before this Court. Newness in the 35 USC 101 sense requires only that the subject matter which falls within one of the enumerated categories did not always exist. That is, it is not a law of nature, abstract idea or mathematical formula.[110] Clearly the Respondents' invention is a contrivance of man which did not always exist.

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[109]It must be noted that the Carre application and the Coulter patent which were both cited to the PTO by the Respondents, were before the PTO during the entire prosecution of Respondents' application. However, neither the examiner nor the Board of Appeals ever raised either the Carre application or Coulter patent as a possible ground of rejection of Respondents' claims under 35 USC 101, 102 or 103.

[110]See *Parker v. Flook*, 437 US 584, 98 S. Ct. 2522 at 2527 and footnote 15 (1978).

The separate question of whether or not an invention is patentable over a body of technical knowledge publicly known is a fact question which requires a comparison of Respondents' invention with such prior art inventions of others under 35 USC 102 and 103. It is not a question within the purview of 35 USC 101.

By citing the new references, the Commissioner is now attempting to raise new grounds of rejection which properly fall under 35 USC 102 and 103 for which no findings of fact have been made on the record below and are not before this Court.[111] In effect, the Commissioner is asking this Court to perform the functions of the PTO and to re-examine Respondents' patent application in view of two nerly cited references and without the benefit of any findings of fact regarding these issues. Respondents have never admitted nor has it ever been established in the record below that either the Carre application or the Coulter patent disclose the combination of hardware elements now being claimed by Respondents.[112] They do not. It should be noted that the

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[111]The Examiner first rejected Respondents' claims under 35 USC 102 as unpatentable over the Hauck patent. In making this rejection, the Examiner stated: "The apparatus in Figure 1 of Hauck cooperates to perform the function of Applicant's claimed invention." However, when presented with this rejection, similar in substance to the Petitioner's new allegations, Respondents had the opportunity to present persuasive arguments which the Petitioner noted resulted in the Examiner's removal of the rejection.

[112]In general, a mere application for a patent is not a part of the prior art since an application is confidential and the public cannot be informed of its contents until a patent issues upon it. But an application which eventuates into a patent, while such patent may not be part of the prior art as it may have issued after the patent in suit, can nevertheless be used to prove that the patentee of the patent in suit was not the original and first inventor or discoverer of any material and substantial part of the thing patented. (Deller's Walker on Patents, Section 107, page 124).

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Respondents' disclosure includes Fig. 15a, 15b and 15c,[113] not shown in either Carre or Coulter. For example, Fig. 15b[114] further discloses additional hardware such as a hardware gate HG, reference numerals 1507 and 1514. This hardware gate and how it is used and cooperates with other elements of the claimed combination is further described in Respondents' specification.[115] Additionally Figs. 15b and 15c disclose additional hardware structure and machine operations.[116] This structure is claimed in claims 4-6.[117] Moreover, since Respondents' patent application was filed before the Coulter, et al patent issued, even the common portion of Respondents' invention cannot be considered as a "known machine" or a "familiar general purpose digital computer" as the Commissioner now alleges.

(footnote continued from preceding page)

This Court has held that earlier filed copending patents are "prior art" as that term is used in 35 USC 103 against copending applications of different inventors. However, this finding was based upon the factual record established within the PTO and that there was no dispute that Applicant's invention as well as his application, were made after the cited copending application was filed (*Hazeltine Research, Inc. v. Brenner,* 382 US 252, 86 S. Ct. 335, 147 USPQ 429 (1965).

Consistent with this Court's decision in *Graham v. John Deere Co.,* 383 US 1, the scope and content of the prior art must be determined. The essence of the evidentiary question is what the disclosure of a prior art patent means to one of ordinary skill in the art. Where a portion of that prior art disclosure refers to the state of the art as it existed at the time that the application for the prior art patent was filed, that disclosure likewise must be tested against a standard of what it means to one of ordinary skill in the art.

[113]JA-120.

[114]JA-120.

[115]JA-78, 79.

[116]JA-120.

[117]JA-207

This additional hardware structure and other structure not disclosed in either Carre or Coulter must be given its full weight in considering the invention as a whole. By overlooking such structures and also the microprogrammed control element and how these and other elements cooperate with each other as the Commissioner is now urging, he could hold any invention unpatentable. For example, such revolutionary inventions as Lee de Forrest's electron triode amplifier tube could be held unpatentable by citing Fleming's invention which is identical in structure and arrangement to de Forrest's invention except for a small piece of wire inserted btween the anode and cathode of Fleming's diode. Thus the PTO could ignore the fact that this little piece of wire allowed the other elements to cooperate and function with each other in a manner so different that they would launch mankind into the electronic era. However, this is an improper forum to evaluate novelty in view of the patents of others, since the issue of novelty and unobviousness is not before this Court and entail fact issues which cannot be resolved without the introduction of additional evidence.

Furthermore, the Commissioner in citing the Coulter Patent No. 3,891,974 to show "the same hardware arrangements now claimed in Respondents' diagrams" is tacitly admitting that the Respondents' invention is statutory subject matter. By equating the Respondents' invention to the patented Coulter invention, he implie[illegible] admits that the Respondents' invention also comprises [illegible]utory subject matter which is the sole issue before this Court.[118]

[118]Utilizing Socratic logic the truth of this statement is evident. When the Commissioner compares the Respondents' invention to the Coulter invention and concludes that Coulter ". . . and others had previously invented a computer machine with the same hardware arrangement now claimed in Respondents' diagrams . . ." he acknowledges that the subject matter of both inventions is the same. However, since the Coulter

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This Court need not decide any broad policy issues with respect to the patentability of computer programs as advocated by the Commissioner. There is no computer program disclosed or claimed by the Respondents. Moreover, as this Court has clearly articulated, such policy issues are to be addressed by Congress.

The Respondents' invention is a creation of man — a new computer machine. It is new in the 35 USC 101 sense in that it has not always existed. It clearly comprises that type of subject matter that the statute was enacted by Congress to protect, as interpreted by the decisions of this Court including *Benson, Flook* and *Chakrabarty.* The invention is a new combination of elements which has not always existed and which elements cooperate and function to achieve an improved result. Such new combinations have always been patentable subject matter under 35 USC 101. The granting of a patent on such improvement combination does not extend the life of any existing patents on the computer it improves. Moreover, merely because such combination is a permanent part of a computer machine does not convert it into unpatentable subject matter under 35 USC 101. Holding

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(footnote continued from preceding page)

invention has matured into a patent, it must be statutory under 35 USC 101. If the subject matter of the Respondents' invention is the same as the Coulter invention it too must be statutory.

If the Commissioner wishes to rely on the Coulter patent, he should seek a remand in order to apply those references against the Respondents' invention under 35 USC 102 or 103 instead of seeking to import 35 USC 102 or 35 USC 103 issues into the statutory interpretation of 35 USC 101. It is this statutory duty of the Commissioner that he has consistently refused to perform with respect to computer related inventions and insists on melding 102 and 103 requirements in 101.

this invention as statutory subject matter will not deprive the public of any rights that it has heretofore freely enjoyed.

CONCLUSION

Accordingly, it is hereby requested that the decision of the court below be affirmed.

Respectfully submitted,

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RESPONDENTS' APPENDIX

The Commissioner has presented throughout his Brief erroneous conclusions, misstatements of fact, quotations out of context, and other clearly misleading statements. Respondents have identified below some of the more flagrant errors contained in the Commissioner's Brief and have also presented the correct information. Because of space limitations, no attempt has been made to identify and correct all of the Commissioner's errors.

1. Erroneous Statement of Commissioner: (PB 18)

"A patent on a computer program . . . or on the machine with the microprogramming would in effect grant further patent on an old machine. . . . This would extend the term of the original patent on the machine."

Correct Statement:

This statement discloses a fundamental misunderstanding of the invention and the Patent Laws. The Respondents have created an apparatus which when built into a computer improves computer performance. They are seeking patent coverage only on the claimed improvement as sanctioned by 35 USC 101. Therefore, the notion that a second patent on a separate and distinct invention which is physically incorporated into an earlier patented machine extends the term of the first patent on the machine is false. Consistent with 101, the public is free to use the original machine in any manner that they originally enjoyed prior to the patenting of Respondents' invention.

2. Erroneous Statement of Fact by the Commissioner: (PB 20 Footnote 30)

". . .the language of the specification. . . strongly suggests that the control unit can be programmed electrically by the person using the computer in the field."

Correct Statement of Fact:

The control store unit disclosed in Respondents' specification is a 9K bipolar integrated circuit programmable read-only memory (PROM) mixed with read/write random access store (RAM) (JA 61). Bipolar integrated circuit PROMs are "programmed" by physically "breaking" connections of circuit elements in series with such bipolar transistor circuits. The term "bipolar" does not encompass MOSFETS which are described in the Kline text cited by the Commissioner as being used in reprogramming a PROM (See Microprogramming: Principles and Practices, by Samir S. Husson, p. 153).

Moreover, the "Microcomputer Dictionary and Guide", by Charles J. Sippl and David A. Kidd, Matrix Publishers Inc., Champaign, Il., 1975, has this to say about PROM programming steps. There are generally five necessary steps to program PROMs so that the microcomputer can control various systems.

"1. The designer lists the sequence of mechanical operations needed."

"2. From this sequence of operations a program sheet is written."

Although the "state of the art terms" refer to "programming" or "microprogramming" a ROM or PROM, it is clear that a *designer* utilizes this technique to build "mechanical operations" into the machine.

3. Erroneous Statement of Commissioner: (PB 4, 5)

"An instruction in the firmware developed by Respondents permits the user to communicate with the scratchpad registers and to switch data back and forth from the registers to the system base in the main memory."

Correct Statement of Fact:

The so-called switch base instruction is hardware incorporated into Respondents' computer. It is not included within user programs. Moreover, no data is transferred from the scratchpad memory registers to the system base.

4. Erroneous Statement of Fact: (PB 2, 3)

"The computer's hardware includes a main memory, which has a system base with which the user of a computer can communicate."

Correct Statement of Fact:

The user cannot access the system base. It is only accessible via the boundary address register (BAR) which can be read but not written. (JA53-54). The (BAR) separates an area in main memory reserved for hardware in the system base (JA 54). Customer user programmers do not need a system base structure to communicate with the computer since they have always and can continue to communicate directly with a computer via their own programs.

5. Misleading Quotation of Commissioner: (PB 3, 4)

"Firmware consists of a sequence of basic instructions as a microprogram in the computer's memory."

The above is the Commissioner's quotation from p. 754 of Ross taken from 59 Journal Patent Office Society. This quotation fosters the misconception that firmware is nothing more than a series of instructions.

Additional Quotation from the Commissioner's Identical Source: On p. 737 of 59 Journal Patent Office Society, Mr. Ross makes it unequivocally clear that firmware is a machine part. He states:

"A generalized example of firmware is 'a small, easily

replaceable part which is pre-punched or wired in such a way that when activated . . . cause[s] a particular sequence of computer operations to take place. . . .' "

Other errors of fact were also identified in Respondents' Brief in Opposition of a Writ of Certiorari to the United States Court of Customs and Patent Appeals pages 1b-3b.